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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/618,708	07/18/2000	Ramon Coronel	36-0032	2014

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EXAMINER

WILLE, DOUGLAS A

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 11/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/618,708

Applicant(s)

CORONEL ET AL.

Examiner

Douglas A Wille

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 11-42 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 11-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Action Status*

1. In view of Applicant's petition to consider all claims, the prior Office Action is withdrawn and all claims will be considered. Since a petition must be disposed before appeal can occur, Applicant's request to appeal the prior rejection is moot.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 8, 14, 17, 26, 32, 35 and 36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 8 and 26 refer to the light source as being regrowth semiconductor material. This is not understood. In normal semiconductor terminology regrowth refers to a process where a material is first grown, some modification is made to the grown material and the same material is regrown, i.e., growth is reinitiated. If a single material is first grown and then a second material is added epitaxially it is referred to as epitaxial growth. "regrowth" must be clarified.

5. Claims 14 and 32 refer to the laser diode modulator as having a discrete channel spectrum of 1300 – 1600 nm. This is not understood. First, what is a discrete channel spectrum. Does this mean that the modulator only responds to these wavelengths? Second, it appears that it is intended that the modulator functions simultaneously over the whole range of wavelengths. How is this possible for an electroabsorption material?

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6. Claims 17 and 35 refer to a material selected from the group In, Ga, Al, arsenide and phosphide. What arsenide material is this? What phosphide material is this? Is this intended to refer to arsenic and phosphorous?

### ***Double Patenting***

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1, 2, 4 - 8 and 11 - 40 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 - 20 of U.S. Patent No. 6,353,264. Although the conflicting claims are not identical, they are not patentably distinct from each other because the same features are claimed in both the Application and the patent as follows;

for claims 1, 2, 4, 19, 37 and 39 see claim 1 and note with respect to claim 37 the formation of an IC is obvious and with respect to claim 39, since assembly is performed deassembly for replacement is obvious,

for claim 5 see claim 20

for claims 6, 24, 38 and 40 see claim 6,

for claims 7 and 25 see claim 7,

for claims 8 and 26 see claim 8,  
for claims 11 and 29 see claim 11,  
for claims 12 and 30 see claim 12,  
for claims 13 and 31, see claim 13,  
for claims 14 and 32, see claim 14,  
for claims 15 and 33, see claim 15,  
for claims 16 and 34, see claim 17,  
for claims 17 and 35, see claim 18,  
for claims 18 and 36, see claim 19,  
for claim 20, see claim 2,  
for claim 21, see claim 3,  
for claim 22, see claim 4,  
for claim 23, see claim 5.

9. Claims 3, 41 and 42 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,353,264 in view of patent 5,568,574. ('574) shows (see Figure 1 and column 7, line 32) a strip optical waveguide with an output grating with controllable output angle. It would have been obvious to use this output method since it is known to be functional.

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1 - 5, 19, 20, 22, 23, 37 and 39 - 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zavracky et al. in view of Tanguay, Jr. et al.
12. With respect to claim 1, Zavracky et al. show (see column 5, line 34 et seq. and Figure 7) a multilayer stack of wafers (column 10, line 66) which may be SOI (column 2, line 24) and show that the wafer to wafer interconnect can be performed with LEDs, which provide a node, and fiber optics (column 12, line 48). Zavracky et al. do not show how the fiber optics are coupled to the wafers but Tanguay, Jr. et al. show (see Figure 1 and column 5, line 47 et seq.) that an optical waveguide can be used to interconnect multiple chips and the waveguide can be a rib (column 7, line 36). It would have been obvious to use the Tanguay, Jr. et al. structure in the Zavracky et al. device to provide a coupling means. Note that the claim is for a single wafer with external devices but the multilayer structure of Zavracky et al. has devices (wafers) external to any of the wafers in the stack.
13. With respect to claim 2, the bus 12 of Tanguay, Jr. et al. has multiple couplers which would be coupled to each layer.
14. With respect to claim 3, the couplers of Tanguay, Jr. et al. are inherently Bragg.
15. With respect to claim 4, there are a plurality of wafers which would be placed at gratings.
16. With respect to claim 5, Tanguay, Jr. et al. shows slab waveguides.
17. With respect to claim 41, there is a plurality of devices, i.e. wafers.
18. With respect to claim 42, Tanguay, Jr. et al. show slab waveguides.

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19. With respect to claims 19 and 39, since the stack is an assembly it would be obvious to disassemble the stack for any reason and it is well known in the art to replace defective devices/chips/wafers.

20. With respect to claim 20, Zavracky et al. show SOI with a silicon substrate which is thermally conducting.

21. With respect to claim 37, Zavracky et al. show the interconnect as being centrally located but it would be obvious to put the interconnect at any position of the wafer, as long as increased transmission paths were not required.

22. With respect to claim 22, Si is shown.

23. With respect to claim 23, it would be obvious to provide any semiconductor circuit, including an ASIC.

24. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zavracky et al. in view of Tanguay, Jr. et al. and further in view of Fitch et al.

25. Fitch et al. show that a stacked structure can be formed using SOS (column 3, line 55 and column 7, line 31). It would be obvious to use the SOS shown by Fitch et al. instead of the specific structure shown by Zavracky et al. as a design alternative since SOS is a form of SOI.

26. Claim 24, 25 and 29 - 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zavracky et al. in view of Tanguay, Jr. et al. and further in view of Jandel.

27. With respect to claim 24, the base references do not show modulation methods although direct modulation might be suggested but Jandel shows (column 4, line 14 et seq.) that electroabsorption modulators can be closely integrated with single wavelength lasers (column 1, line 20). It would have been obvious to use the Jandel modulator in the base device for the

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advantage shown. The base references do not specifically describe a detector but the use of an optical detector for a fiber optic data bus is essential for operation and is obvious, as is the use of an amplifier.

28. With respect to claim 25, the LED of Zavracky et al. is hybrid.

29. With respect to claims 30 and 31, a semiconductor modulator is shown.

30. With respect to claim 29, it would be obvious to use either a LED or a laser structure as design alternatives.

31. With respect to claim 32, it would be obvious to select any wavelength in a high transmission region of the waveguide material.

32. With respect to claim 33, since the laser can be formed integrally it would also be obvious to form the modulator integrally to increase the degree of integration.

33. With respect to claims 34, 35 and 36, III-V materials are shown which includes such materials as GaAs etc.

34. Claim 28 rejected under 35 U.S.C. 103(a) as being unpatentable over Zavracky et al. in view of Tanguay, Jr. et al., Jandel and further in view of Lee.

35. Lee shows that porous silicon can be used as a LED and avoids manufacturability problems with other devices (column 1, line 30). It would be obvious to use the porous silicon as the LED material to provide manufacturability.

36. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zavracky et al. in view of Tanguay, Jr. et al., Jandel and further in view of Nanishi et al.



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37. With respect to claim 26 and 27, Nanishi et al. show that III-V materials can be grown on Si substrates to form light emitting diodes or lasers (column 3, line 23) to form OEICs. It would have been obvious to form the OEICs to provide integrated structures.

38. Claims 6, 7, 12, 13, 38 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zavracky et al. in view of Tanguay, Jr. et al. and further in view of Jandel.

39. With respect to claim 6, 12, 13, 38 and 40, the base references do not show modulation methods although direct modulation might be suggested but Jandel shows (column 4, line 14 et seq.) that electroabsorption modulators can be closely integrated with single wavelength lasers (column 1, line 20). It would have been obvious to use the Jandel modulator in the base device for the advantage shown. The base references do not specifically describe a detector but the use of an optical detector for a fiber optic data bus is essential for operation and is obvious, as is the use of an amplifier.

40. With respect to claim 7, the LED of Zavracky et al. is hybrid.

41. Claims 8, 11, 14, 15 and 16 - 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zavracky et al. in view of Tanguay, Jr. et al., Jandel and further in view of Nanishi et al.

42. With respect to claim 8, Nanishi et al. show that III-V materials can be grown on Si substrates to form light emitting diodes or lasers (column 3, line 23) to form OEICs. It would have been obvious to form the OEICs to provide integrated structures.

43. With respect to claim 11, it would be obvious to use either a LED or a laser structure as design alternatives.

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44. With respect to claim 14, it would be obvious to select any wavelength that is in a high transmission region of the waveguide material.

45. With respect to claim 15, since the laser can be formed integrally it would also be obvious to form the modulator integrally to increase the degree of integration.

46. With respect to claims 16 - 18, III-V materials are shown which includes such materials as GaAs etc.

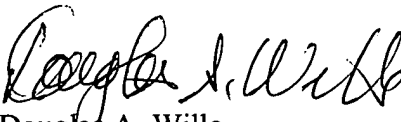
***Response to Arguments***

47. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A Wille whose telephone number is (703) 308-4949. The examiner can normally be reached on M-F (6:15-2:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
Douglas A. Wille  
Primary Examiner